

Claims

- [c1] 1.A night vision system for a vehicle comprising:
 a first light source for illuminating a region proximate the vehicle, said light source operating at a first wavelength;
 a pulsed second light source for illuminating a region forward of the vehicle, said second light source operating at a second wavelength and a first time period;
 a light sensor for generating a timing signal in response to detecting light at approximately said second wavelength; and
 a controller programmed to pulse said first light source between pulses of said second light source in response to said timing signal, and modify said first time period as a function of said timing signal.
- [c2] 2.A night vision system according to claim 1 wherein said controller is programmed to pulse said first light source at a duty cycle less than 50% in response to said timing signal.
- [c3] 3.A night vision system according to claim 2 wherein said controller is programmed to determine a first time difference between a second light source pulse and said timing signal, determine a second time difference between said timing signal and the next second light source pulse, and modify said first time period as a function of said first and second time differences.
- [c4] 4.A night vision system according to claim 3 wherein said controller is programmed to modify said first time period based on a ratio of said first and second time differences.
- [c5] 5.A night vision system according to claim 1 wherein said second light source also illuminates a region rearward of the vehicle.
- [c6] 6.A night vision system according to claim 5 wherein the light pulses of said second light source in the forward direction differ from the light pulses of said second light source in the rearward direction.
- [c7] 7.A night vision system for a vehicle comprising:
 a first light source for illuminating a region proximate the vehicle, said light

source operating at a first wavelength;
a pulsed second light source for illuminating a region forward of the vehicle,
said second light source operating at a second wavelength and a first time
period;
a light sensor for generating a timing signal in response to detecting light at
approximately said second wavelength; and
a controller programmed to pulse said first light source in response to said
timing signal at a second timing period approximately 180 ° out-of-phase with
said timing signal.

[c8] 8.A night vision system according to claim 7 wherein said controller is
programmed to pulse said first light source at a duty cycle less than
approximately 50% in response to said timing signal.

[c9] 9.A night vision system according to claim 7 comprising a gated receiver for
receiving light reflected off objects illuminated in said region by said first light
source and generating a signal responsive to said received light.

[c10] 10.A night vision system according to claim 7 wherein said controller is
programmed to turn off first light source in response to said timing signal,
modify said first time period of second light source, and synchronize said first
and second light sources such that said first light source is off for a period of
time relating to the periodic detection of the second wavelength of light.

[c11] 11.A night vision system according to claim 7 wherein said first and second
light sources are laser diodes, and said second light source is pulsed at a duty
cycle less than 50%.

[c12] 12.A night vision system according to claim 11 wherein said light sensor is a
photocell or photodiode.

[c13] 13.A night vision system according to claim 7 wherein said second light source
illuminates a region rearward of said vehicle.

[c14] 14.A night vision system according to claim 7 comprising a pulsed third light
source for illuminating a region rearward of the vehicle, said third light source

operating at a third wavelength and said first time period.

[c15] 15.A method for an active night vision system for a vehicle comprising:
activating a first light source to illuminate a region proximate the vehicle, said light source operating at a first wavelength;
pulse activating a second light source to illuminate a region forward of the vehicle, said second light source operating at a second wavelength and a first time period;
generating a timing signal in response to detecting light at approximately said second wavelength, said timing signal indicative of another vehicle's second light source;
determining a first time difference value between a second light source pulse and said timing signal and a second time difference value between said timing signal and a next second light source pulse; and
modifying said first time period as a function of said first and second time difference values.

[c16] 16.A method according to claim 15 comprising pulse activating said first light source in response to said timing signal at a duty cycle less than 50%, said first 6 light source pulses occurring at approximately a midpoint between said second light source pulses.

[c17] 17.A method according to claim 15 wherein modifying includes advancing or delaying said first time period as a function of a ratio of said first and second time difference values.

[c18] 18.A method for an active night vision system for a vehicle comprising:
activating a first light source to illuminate a region proximate the vehicle, said light source operating at a first wavelength;
pulse activating a second light source to illuminate a region forward of the vehicle, said second light source operating at a second wavelength and a first time period;
generating a timing signal in response to detecting light at approximately said second wavelength, said timing signal indicative of another vehicle's second light source; and

pulse activating said first light source in response to said timing signal at a second timing period approximately 180° out of phase with said timing signal.

[c19] 19.A method according to claim 18 comprising turning off said first light source in response to said timing signal, modifying said first time period of second light source, and synchronizing said first and second light sources such that said first light source is off for a period of time relating to the periodic detection of the second wavelength of light.

[c20] 20.A method according to claim 19 comprising pulse activating said second light source to illuminate a region rearward of the vehicle.

[c21] 21.A method for an active night vision system for a vehicle comprising:
illuminating a region proximate the vehicle with a first light source operating at a first wavelength;
pulse illuminating a region forward of the vehicle, said forward pulse being at a second wavelength;
pulse illuminating a region rearward of the vehicle, said rearward pulse being different than said forward pulse in either wavelength or duration; and
modifying said rearward pulse in response to detecting a forward pulse of another vehicle.